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EXAMINER

EMPIE, NATHAN H

ART UNIT

PAPER NUMBER

1712

NOTIFICATION DATE

DELIVERY MODE

10/20/2010

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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11. The request for reconsideration has been considered but does NOT place the application in condition for allowance because:

Applicant's arguments filed 10/12/10 have been fully considered but they are not persuasive.

In response to applicant's arguments that "the depth of etching is not a consideration for any of the references (pg 2-3 of remarks), the examiner disagrees with this argument and directs the applicant's attention to at least Yamazaki which explicitly teaches the surface being etched to form a roughened / etched surface, and since Yamazaki has explicitly taught wherein such etching achieves etched surface features on the order of 0.1 to 5 microns. Skorupski additionally teaches etching to remove at least 0.45 microns from the substrate. Therefore the depth has been a consideration in the references.

The applicant directs the examiner's attention again to the declaration under 37 CFR 1.132 filed 10/2/09 (pg 3-4 of remarks). Here again, the examiner asserts that the declaration under 37 CFR 1.132 filed 10/2/09 is insufficient to overcome the rejection of claims 2, 4, 6-8, 10-12, 14, 16, and 19-28 based upon the cited prior art as set forth in the last Office action because:

With respect to applicant's assertion that "...Example 1 of the specification which is representative of the scope of the claims. If there are reasons why the Examiner feels the Example, is not representative of the scope of claim 1, Applicant's request that the Examiner state them on the record..." First, there is no claim 1 currently pending, but with respect to at least the pending independent claims, the Examiner maintains (as he had previously articulated and put on the record) that: the presented scientific evidence has only selected one specific

Art Unit: 1712

iteration (sharing the same chemistry with cited example 1) with regard to etching conditions (a single etching chemistry species (KOH), a single solvent mixture (water / ethylene glycol monobutyl ether), a single thickener (Carbomer), all at a single specific concentration, performed at a single etching temperature, for a single etching time, at a specific printing / dispensing parameter etc.) while the claimed subject matter covers a significantly larger scope without such limitations (as claimed: any organic / inorganic base (not just solely KOH), at over 4-48% by weight, at any temperature, time from 30s to 5 min, a wide variety of solvents in various combination, and any thickener at any %). Thus there is no showing that the objective evidence of unexpected results is commensurate in scope with the claims.

Further the prior art have all provided a variety of ranges with respect to the etching conditions (etching chemistry species, concentration, etching temperature, etching time, silicon orientation, etc.), the examiner is unconvinced by the evidence at one singular data point to refute the entirety of the teachings of the prior art references. One of ordinary skill in the art would appreciate that alterations in the above etching conditions would influence the rate of etching per specific materials, and as such, one data point is not sufficient to outweigh the evidence of obviousness. Further as discussed in the previous final rejection, etching depths described by primary references Yamazaki and Skorupski both have taught etching depth ranges overlapping the claimed 1-3 microns, and further have taught that it is well known in the art to vary the etching species / concentration relative to the chemical composition of the substrate to be etched. Additionally, no singular prior art reference is used to reject any singular claim, one cannot show nonobviousness by attacking references individually where the rejections are based

Art Unit: 1712

on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In view of the forgoing, when all of the evidence is considered, the totality of the applicant's arguments towards nonobviousness fails to outweigh the evidence of obviousness.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., compositions of the present application have to be free of particles (pg 3 of declaration), that the etchants possess a specific storage stability, diffusion mechanism (pg 4 of remarks) and that the claimed composition is used in a process further requiring "subsequent deposition of metallic circuits into the etched lines" (pg 6 of arguments), "the compositions of Skorupski do not result in enhanced silicon edge isolation" (pg 6 of arguments) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Further, the examiner asserts that the arguments of counsel cannot take the place of evidence in the record. *In re Schulze*, 346 F.2d 600, 602, 145 USPQ 716, 718 (CCPA 1965).

In response to applicant's arguments against the references individually (Yamazaki, Ichinose, Skorupski, Klein, Ohlsen, throughout pgs 2-8 of remarks), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

In response to applicant's argument that Yamazaki / Ichinose is nonanalogous art (pg 4-5), it has been held that a prior art reference must either be in the field of applicant's endeavor or,

Art Unit: 1712

if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Prior art that is in a field of endeavor other than that of the applicant or solves a problem which is different from which the applicant was trying to solve, may also be considered for the purposes of 35 U.S.C. 103 “[t]he first error... in this case was... holding that courts and patent examiners should look only to the problem the patentee was trying to solve. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter... The second error [was]... that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem.” *KSR International Co. v. Teleflex Inc. (KSR)*, 550 U.S. \_\_\_, 82 USPQ2d 1385 (2007). In this case, both Yamazaki and Ichinose are both (as is the applicant’s invention) in the field of alkali etchants and method of applying alkali etchants. In response to applicant’s argument that there is no teaching, suggestion, or motivation to combine the references, the examiner recognizes that obviousness may be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988), *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992), and *KSR International Co. v. Teleflex, Inc.*, 550 U.S. 398, 82 USPQ2d 1385 (2007). In this case, the motivation to thicken the etching medium taught by Yamazaki is provided by Ichinose which teaches that etching with a paste “has excellent selectivity, and does little to no damage to the non-etching region” (col 1 lines 8-

Art Unit: 1712

16), additionally, Ichinose teaches that applying the etchant as a paste is advantageous over conventional methods in that no pre-processes for forming a positive resist pattern, exposure, and development are required to apply an etched pattern to a surface; in addition, the post-process of resist removal is not needed (col 4 lines 7-30). Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have thickened, as taught by Ichinose, the etching medium taught by Yamazaki to enable spatial etch selectivity that would eliminate processing steps.

In response to applicant's argument that Skorupski "does not etch silicon surfaces" (pg 5 of remarks). The examiner disagrees and directs the applicant to [0020] (for example) of Skorupski wherein silicon and silicon containing compositions are taught as suitable and conventional substrates to be etched.

In response to applicant's argument that "none of cited references teach or suggest a printable thickened etching paste having from 10-90% by weight of a solvent which is a mixture of water and at least one other solvent" (pg 7 and throughout pgs 2-7 of remarks). The examiner directs the applicant to the teaching in Klein (such as pg 3) that it is well known in the etching art that water and mixtures of water with other organic solvents can predictably serve as solvents for such thickened etching media, and has similarly taught the solvent at a portion of 10-90 wt% (pg 3). In response to applicant's argument that Klein is nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). Prior art that is in a field of endeavor other than

Art Unit: 1712

that of the applicant or solves a problem which is different from which the applicant was trying to solve, may also be considered for the purposes of 35 U.S.C. 103 “[t]he first error... in this case was... holding that courts and patent examiners should look only to the problem the patentee was trying to solve. The Court of Appeals failed to recognize that the problem motivating the patentee may be only one of many addressed by the patent's subject matter... The second error [was]... that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem.” *KSR International Co. v. Teleflex Inc.* (*KSR*), 550 U.S. \_\_\_, 82 USPQ2d 1385 (2007). In this case, both the method of Skorupski and Klein are both (as is the applicant’s invention) in the field of etching silicon containing surfaces and methods of applying such etchants. Additionally, Klein is in the field of applicant's endeavor, namely a novel etching media in the form of etching pastes and use of such media. Further Klein has explicitly provided the motivation for combination that it allows a printable, homogeneous etching paste which is significantly less expensive than conventional wet and dry etching methods in the liquid and gas phases (pg 2), additionally use of a thickened paste allows for a high degree of automation and surface design (pg 2, 5). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to have thickened, as taught by Klein, the etching medium taught by Skorupski to enable a printable etching process which is significantly less expensive, and possesses a high degree of automation and surface design.

In response to applicant’s arguments that “However, there is nothing which would lead a skilled worker to choose from among the 36 specific solvents listed or any of the hundreds of possible solvents from among the classes of solvents to arrive at a mixture of water with another solvent” (pg 6 of remarks); the examiner asserts that the primary reference has already taught the

Art Unit: 1712

water component, and Klein has taught that it is well known in the etching art to provide aqueous mixtures of solvents to predictably perform solvent functions for thickened etching media, and further additionally serve to suitably remove the corrosive media and clean the surface.

Therefore it would have been obvious to one of ordinary skill in the art at the time of invention to have incorporated an additional solvent species with water to achieve the predictable result of serving as solvent for a thickened etchant. Further in regard to size of the suitable solvents group taught by Klein, the examiner asserts that significant overlap of the taught solvents and the claimed solvents exist between Klein and the claimed invention. Further when the species is clearly named, the species claim is anticipated (rendered obvious) no matter how many other species are additionally named. *Ex parte A* 17 USPQ2d 1716 (Bd. Pat. App. & Inter. 1990).

In response to applicant's argument that the examiner's conclusion of obviousness is based upon improper hindsight reasoning (pg 7-8), it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971). The examiner agrees with applicant that "A skilled worker would recognize that an etchant must be adapted to the surface which it will etch" (pg 4 or remarks) therefore the examiner maintains that any adaptations involved in the combinations of the prior art are within the level of one of ordinary skill in the art. Further the examiner asserts the motivation for combination of the prior art as presented is further explained in response to specific arguments above and in the appropriate rejections of 7/9/10.



Art Unit: 1712

As to the dependent claims, they remain rejected as no separate arguments are provided.

The final office action of 7/9/10 is maintained.

/Timothy H Meeks/

Supervisory Patent Examiner, Art Unit 1715